London Borough of Brent Air Quality Annual Status Report for 2017

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This report provides a detailed overview of air quality in Brent during 2017. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2016 (LLAQM.TG(16)). https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TEOM	Tapered Element Oscillating Microbalance
TfL	Transport for London

Table A. Summary of National Air Quality Standards and Objectives

Pollutant	**Objective (UK)**	**Averaging Period**	**Date[1]**
Nitrogen dioxide - NO_2	200 μg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 μg m^{-3}	Annual mean	31 Dec 2005
Particles - PM_{10}	50 μg m^{-3} not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 μg m^{-3}	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 μg m^{-3}	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO_2)	266 μg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 μg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 μg m^{-3} mot to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: [1] by which to be achieved by and maintained thereafter

1. Air Quality Monitoring

The London Borough of Brent operated four automatic monitoring stations all of which are within the Council's air quality management area.

- John Keble Primary School site (BT6) – roadside (R), measures NO_2 and PM10 (by Tapered Element Oscillating Microbalances (TEOM))
- Ark Franklin Academy site (BT8) roadside (R), measures NO_2 and by TEOM measures both PM_{10} and $PM_{2.5}$ –
- Drury Way/ Ikea site (BT4)[2]- roadside (R), measures NO_2 and PM10 (by TEOM)
- Neasden Lane site (BT5) - industrial (I), measures NO2 and PM10 (by TEOM)

The London Borough of Brent also undertook monitoring of annual mean NO_2 concentrations using passive diffusion tubes at 27 sites located throughout the Borough. This included one location monitored in triplicate (site 52 A, B and C) and one background location (Tube ID 33A).

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2017

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
BT4	Ikea	520886	185169	Roadside	Y	38	2	2.5	NO_2, PM_{10}, $PM_{2.5}$, O3	Chemiluminescent; FDMS
BT5	Neasden Lane	521511	185204	Industrial	Y	35	4	2.5	NO_2, PM_{10}	Chemiluminescent, TEOM, VCM method
BT6	John Keeble Primary School	521619	183554	Roadside	Y	10	2	2.5	NO_2, PM_{10}	Chemiluminescent, TEOM, VCM method
BT8	Ark Franklin Primary School	523716	183030	Roadside	Y	10	2	2.5	NO_2. PM_{10}	Chemiluminescent, TEOM, VCM method

[2] [2] The Ikea site (BT4) is a King's College Supersite and in addition to the pollutants listed above it also measures carbon dioxide (CO_2) and ozone (O_3).

Table C. Details of Non-Automatic Monitoring Sites for 2017

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)
1	Junction of Kenton Rd / Upton Gardens	516929	188560	*Roadside*	*Y*	15	*1*	*2.0*	NO_2	*N*
2	Harrow Rd, Sudbury Court Drive	515793	186042	*Roadside*	*Y*	10	*0.5*	*2.5*	NO_2	*N*
4	Junction of Shaftesbury Avenue / Woodcock Hill	518254	187771	*Roadside*	*N*	6	*1*	*2.5*	NO_2	*N*
7	Bridgewater Rd / Ealing Road	517921	183716	*Roadside*	*Y*	17	*2*	*2*	NO_2	*N*
9	Junction of East Lane / Wembley Hill Road	518499	186168	*Roadside*	*Y*	20	*1*	*2*	NO_2	*N*
17	Old Church Lane junction with Neasden Lane	520480	186537	*Roadside*	*Y*	4	*0.5*	*2.5*	NO_2	*N*
21	Central Middlesex Hospital, Central Way	520078	182857	*Roadside*	*Y*	4	*2.0*	*2.5*	NO_2	*N*
22	Junction of Kingsbury Road / Edgware Road	521447	188730	*Roadside*	*Y*	5	*0.5*	*2.5*	NO_2	*N*
23	Junction North Circular Rd / Chartley Avenue	521213	186125	*Roadside*	*Y*	10	*1.0*	*2.0*	NO_2	*N*
26	Dudden Hill Lane junction with High Road	522191	184821	*Roadside*	*Y*	19	*1.0*	*2.0*	NO_2	*N*
29	Junction Dollis Hill Lane / Cricklewood	523191	186571	*Roadside*	*Y*	12	*0.5*	*2.0*	NO_2	*N*
30	Chichele Road near Melrose Ave	523663	185353	*Roadside*	*Y*	9.8	*0.5*	*2.0*	NO_2	*N*
33a	Fryent Park Car Park area	519572	187691	*Background*	*Y*	500	*N/A*	*2.5*	NO_2	*N*

41	R/O 246 Neasden Lane	521455	185920	*Roadside*	*Y*	3	*2.0*	*2.5*	*NO_2*	*N*
48	Kilburn Park Rd near junction with Shirland Road	525196	182517	*Roadside*	*Y*	2	*0.5*	*2.5*	*NO_2*	*N*
52 a,b,c	IKEA, Hut, North Circular Road	520874	185173	*Roadside*	*Y*	40	*2.5*	*2.0*	*NO_2*	*Y*
53	Junction Ealing Road / High Road	518020	185043	*Roadside*	*Y*	15	*1.0*	*2.5*	*NO_2*	*N*
54	Ealing Road / Riverside Gardens	518221	183206	*Roadside*	*Y*	4	*2.0*	*2.5*	*NO_2*	*N*
BRT 42	Police Station, Craven Park	521155	184002	*Roadside*	*Y*	3	*2.0*	*2.5*	*NO_2*	*N*
BRT 43	Pitfield Way	520242	184541	*Roadside*	*Y*	20	*2.0*	*2.0*	*NO_2*	*N*
BRT 53	High Road Wembley	518303	185181	*Roadside*	*Y*	0	*1.0*	*2.5*	*NO_2*	*N*
BRT 55	High Street, Harlesden	521743	183361	*Roadside*	*Y*	3	*1.0*	*2.5*	*NO_2*	*N*
BRT 56	Chamberlayne Road	523635	183153	*Roadside*	*Y*	15	*1.0*	*2.5*	*NO_2*	*N*
BRT 57	Kilburn Bridge	525461	183558	*Roadside*	*Y*	8	*1.0*	*2.5*	*NO_2*	*N*
BRT 58	51 High Road, Willesden	523031	184655	*Roadside*	*Y*	2	*1.0*	*2.5*	*NO_2*	*N*

1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for "annualisation" and for distance to a location of relevant public exposure, the details of which are described in Appendix A.

Table D. Annual Mean NO_2 Ratified and Bias-adjusted Monitoring Results ($\mu g\ m^{-3}$)

Site ID	Site type	Valid data capture for monitoring period % a	Valid data capture 2017 % b	Annual Mean Concentration (($\mu g\ m^{-}$)						
				2011[c]	2012[c]	2013[c]	2014[c]	2015[d]	2016[c]	2017[c]
BT1	Automatic	*N/A*	*N/A*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BT4	Automatic	*87%*	*87%*	**74.9**	**76.1**	N/A	**79.7**	**41.0**	**76**	**72**
BT5	Automatic	*97%*	*97%*	**41.2**	**44.0**	38.9	N/A	38.8	**44**	**45**
BT6	Automatic	*99%*	*99%*	**44.8**	**41.1**	37.5	N/A	N/A	**45**	**45**
BT8	Automatic	*14%*	*14%*	N/A	N/A	N/A	N/A	N/A	N/A	54
1	Diffusion tube	82%	82%	38.7	37.9	**41.0**	**41.9**	**40.1**	**41.13**	36.23
2	Diffusion tube	82%	82%	**42.1**	**42.2**	**46.9**	**46.1**	**41.7**	**51.00**	**41.76**
4	Diffusion tube	82%	82%	**40.4**	**41.8**	**45.3**	**47.9**	**40.3**	**51.08**	**42.74**
7	Diffusion tube	100%	100%	**56.7**	**59.7**	**71.2**	**69.4**	**62.3**	**71.65**	**62.79**
9	Diffusion tube	82%	82%	**44.3**	**46.6**	**50.5**	**53.9**	**47.3**	**57.11**	**49.86**
17	Diffusion tube	91%	91%	**54.1**	**52.8**	**55.5**	**59.6**	**55.4**	**62.49**	**55.67**

Site ID	Site type	Valid data capture for monitoring period % a	Valid data capture 2017 % b	Annual Mean Concentration ((μg m^{-})						
				2011[c]	2012[c]	2013[c]	2014[c]	2015[d]	2016[c]	2017[c]
21A	Diffusion tube	100%	100%	**43.1**	**47.1**	**49.5**	**55.1**	**48.7**	**55.13**	**46.90**
22	Diffusion tube	73%	73%	**51.6**	**54.1**	**57.9**	**64.7**	**56.7**	**65.05**	**58.14**
23	Diffusion tube	82%	82%	**82.1**	**92.8**	**104.5**	**108.7**	**93.2**	**115.39**	**93.88**
26	Diffusion tube	91%	91%	**58.1**	**60.4**	**65.4**	**68.9**	**63.9**	**73.69**	**61.93**
29	Diffusion tube	64%	64%	**63.5**	**75.8**	**79.0**	**82.7**	**74.1**	**85.97**	**55.58**
30	Diffusion tube	73%	73%	**59.1**	**64.6**	**62.5**	**58.6**	**52.6**	**62.63**	**51.29**
33A	Diffusion tube	73%	73%	22.2	24.7	26.3	26.1	22.9	29.14	22.21
41	Diffusion tube	82%	82%	**57.8**	**61.6**	**57.6**	**65.7**	**60.7**	**74.41**	**60.05**
48	Diffusion tube	82%	82%	**69.3**	**76.6**	**70.5**	**63.1**	**56.5**	**71.57**	**59.95**
52	Diffusion tube	*100%*	*100%*	**87.7**	**102.8**	**104.1**	**103.4**	**87.9**	**102.10**	**86.59**
53	Diffusion tube	100%	100%	**66.9**	**66.9**	**64.4**	**70.0**	**66.6**	**83.85**	**68.34**
54	Diffusion tube	91%	91%	**41.9**	**49.7**	**47.0**	**50.3**	**47.1**	**52.49**	**46.00**
BRT 42	Diffusion tube	100%	100%	**43.6**	**45.1**	**48.5**	**47.7**	**41.8**	**49.77**	**42.38**
BRT 43	Diffusion tube	100%	100%	**58.1**	**64.2**	**66.9**	**72.7**	**80.3**	**80.65**	**73.71**
BRT 53	Diffusion tube	100%	100%	**48.1**	**64.8**	**75.0**	**77.1**	**75.7**	**80.77**	**64.95**
BRT 55	Diffusion tube	100%	100%	**70.6**	**76.2**	**70.4**	**76.2**	**73.5**	**91.83**	**76.69**

Site ID	Site type	Valid data capture for monitoring period % a	Valid data capture 2017 % b	Annual Mean Concentration ((μg m^{-})						
				2011[c]	2012[c]	2013[c]	2014[c]	2015[d]	2016[c]	2017[c]
BRT 56	Diffusion tube	82%	82%	**66.5**	**75.2**	**70.1**	**67.7**	**56.8**	**69.43**	**58.29**
BRT 57	Diffusion tube	73%	73%	**81.6**	**100.8**	**88.0**	**86.2**	**85.3**	**84.21**	**64.43**
BRT 58	Diffusion tube	100%	100%	**60.3**	**68.2**	**65.4**	**65.6**	**58.1**	**65.73**	**52.75**

Notes: Exceedance of the NO_2 annual mean AQO of 40 μg m^{-3} are shown in **bold**.

NO_2 annual means in excess of 60 μg m^{-3}, indicating a potential exceedance of the NO^2 hourly mean AQS objective are shown in bold and underlined.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table E. NO_2 Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2017 % [b]	Number of Hourly Means > 200 µg m^{-3}						
			2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]
BT4	*86%*	*86%*	10	**32**	**N/A**	10	0	**33**	***33***
BT5	*97%*	*97%*	2	0	0	**N/A**	0	**25**	17
BT6	*99%*	*99%*	0	0	0	**N/A**	**N/A**	0	0
BT8	*14%*	*14%*	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	0

Notes: Exceedance of the NO_2 short term AQO of 200 µg m^{-3} over the permitted 18 days per year are shown in **bold**.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table F. Annual Mean PM_{10} Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2017 % [b]	Annual Mean Concentration (µg m^{-3})						
			2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]
BT4	*92%*	*92%*	34.5	32.9	34.1	28.6	29.2	33	*33*
BT5	*99%*	*99%*	34.3	32.5	26.5	24.1	31.3	31	30
BT6	*98%*	*98%*	25.5	24.4	25.3	21.2	16.9	20	20

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2017 % [b]	Annual Mean Concentration (µg m^{-3})						
			2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]
BT8	*11%*	*11%*	N/A	N/A	N/A	N/A	N/A	N/A	19

Notes: Exceedance of the PM_{10} annual mean AQO of 40 µg m^{-3} are shown in **bold**.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table G. PM_{10} Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2017 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]	2017 [c]
BT4	*97%*	*97%*	**46**	35	**38**	26	23	**45**	***41***
BT5	*99%*	*99%*	**62**	**57**	17	5	15	**37**	29
BT6	*98%*	*98%*	15	11	10	1	1	9	20
BT8	*11%*	*11%*	N/A	N/A	N/A	N/A	N/A	N/A	0

Notes: Exceedance of the PM_{10} short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in **bold**.
Where the period of valid data is less than 85% of a full year, the 90.4^{th} percentile is shown in brackets after the number of exceedances.

[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a brief summary of the London Borough of Brent's progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2017 are shown at the bottom of the table.

Table J. Delivery of Air Quality Action Plan Measures

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
Cleaner Transport – increase provision of sustainable transport and accelerate uptake of new low emission vehicles in borough fleet	Increase modal share for Walking and Cycling	Our Long Term Transport Strategy 2015 – 2035 outlines our objectives for the provision of sustainable transport and includes a commitment reduce air pollution in the borough. 2 core objectives are to increase the uptake of sustainable and active modes of transport such as cycling and walking and reduce exposure to pollution generated by the Brent transport network. Walking accounts for 29% of trips and cycling 1% in Brent. In recognition of the need to increase modal shift from passenger vehicle use to active and sustainable travel modes of transport such as cycling and walking and separate strategies have been created We published our Walking Strategy this year. Brent Council offers free cycle training to all residents (adult and children) as well as staff in Brent businesses and have provided cycle training to over 1200 Brent residents.	The Long Term Transport Strategy can be viewed via https://www.brent.gov.uk/media/16403671/transport-strategy-2016.pdf Cycling Strategy can be viewed via: https://www.brent.gov.uk/media/16407708/cycle-strategy-updated-april-2017.pdf Walking Strategy can be viewed via https://www.brent.gov.uk/media/16407830/brent-walking-strategy-2017-2022.pdf

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
	Targeted reduction of vehicle diesel use in Brent	Our charges for resident parking permits reward environmentally responsible behaviour and are designed to encourage residents to consider the contribution their vehicle makes to climate change and local air quality. In 2017/18 the council consulted residents on plans for changes to our parking fees and charges, aiming to further promote the modal shift from passenger vehicle use to active and sustainable travel. Plans included the implementation of increased fees for Essential User permits and residential parking permits for household's second and third vehicles and the introduction of a £50 levy on resident parking permits for diesel vehicles. We expect plans to be implemented from 1st October 2018 with further increases proposed annually to 2020.	Our parking permit charges are based on emissions and more info regarding them can be found at https://www.brent.gov.uk/services-for-residents/parking/parking-permits/parking-charges/
	Increasing access to low emission or alternative fuels, speeding up the introduction of the cleanest vehicles to our fleet by upgrade or replacement.	The Mayor announced plans in January 2017 for 10 more Low Emission Bus Zones, deploying the greenest buses in air quality hotspots. One of these zones is set to be Edgware Road (Kilburn to Maida Vale), from Cricklewood Broadway via Kilburn High Road to Shoot-Up Hill. Currently there is one bus route (98) in Borough using electric buses. The A5 corridor (eastern boundary of Borough) was declared a low emission bus zone in 2018 and the introduction of Euro VI buses on 5 routes serving this corridor will result.	We will start work late 2018 to review current provision of vehicles in the council fleet which meets highest standards and/ or use alternative fuels. Low Emission Bus Zone on the A5 – see for more information and a map showing which routes this benefits https://www.brent.gov.uk/your-community/brent-going-green/cleaner-and-greener-bus-routes/

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
	Encourage Car Clubs to use low emission and alternative fuel vehicles in their fleet	The Long Term Transport Strategy includes a commitment to create a Car Club Management Plan. The council will work with car club operators to identify options for increasing the take-up of car club vehicles and provision of the least polluting vehicles for use. We also identify opportunities for the provision of car clubs in new development schemes, in considering areas for controlled parking provision and in response to requests from residents.	
	Cleaning Council Fleet	The council seeks to reduce emissions from our own fleet wherever practicable. This includes the provision and use of electric and hybrid vehicles, the upgrade of all Brent Transport vehicles to Euro 6 and regular review of vehicle provision to identify opportunities for further reduction of vehicles in our fleet. The Council also utilises ZipCar vehicles as part of our fleet, maximising opportunities for the efficient use of vehicles locally whilst reducing our contribution to local congestion and pollution. We continue to review locations to determine where demand is greatest and will factor this into future actions to be defined in the Car Club Management Plan and the emerging Procurement Policy.	
	Support the installation of on-street electric vehicle charge points throughout Brent	Approximately 2,166 electric vehicles are registered to addresses in Brent. Last year the council consulted residents to identify suitable locations for additional on-street electric vehicle charging points. The council is currently installing 30 active, freestanding charge points and associated parking infrastructure as part of the Source London network (with works undertaken by BluePointLondon Ltd).	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
	Support the take-up of electric taxis and commercial vehicles. Implements a Strategy for Transport Planning that supports air quality objectives	The council has begun work to identify suitable locations for the installation of London Rapid Chargers for use by residents with no access to off-street charging points, Taxi drivers and other private hire operators in the borough. Work is ongoing and we are on target to provide at least 50 additional charge points by March 2019. In exercise of our strategic objectives the council regular reviews and updates our Local Transport Plan (as our Local Implementation Plan). A core aim is to reduce the environmental impacts of transport via provision of improved infrastructure for cycling and walking, maintenance, repair and improvements to highways infrastructure to eliminate pinch points and otherwise improve traffic flows.	The council will undertake an annual review of chargers installed from 2020 onwards.
Cleaner Transport – Tackle unnecessary idling by taxis, coaches and other vehicles	Raising local awareness of idling action	In September 2017 the council launched our programme to tackle idling near schools which included the installation of 40 'no-idling' signs in selected locations, the provision of workshops in 8 schools to raise awareness and a toolkit to facilitate similar actions in other schools. This was supplemented by the installation of signage in a further 60 hotspots across the borough. The council has recruited Community Air Quality Champions to assist in raising local awareness about idling action and will assist in the implementation of idling vehicle campaigns at taxi ranks, bus stands and schools and other key locations. Two on-street campaigns have been held to date with a further campaign planned for winter 2018.	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
	Regulation of engine idling Reducing the number of complaints about local idling	The council has reviewed our enforcement procedures so that we can take action to issue fixed penalty notices to the worst offenders when other actions fail and has joined a consortium for idling action with other London Boroughs to share best practice and maximise resources for further projects. In 2017/18 we provided training to enforcement officers to facilitate this process. Complaints logged with the council regarding engine idling are relatively low compared to others– the council received 20 complaints in 2017/18. No formal enforcement action was taken in respect of these complaints. The council uses this and other information to identify idling hotspots which can be targeted for local awareness raising and action.	
Public Health and Community Engagement	Raising awareness in the community	The council publishes information about air quality on our website. We have maintained our membership of the London Air Quality Network annually throughout this time to ensure ready access to current air quality information is available to the public. The Council annually reviews its Air Quality Management Areas using a range of data sources. We make this information available via our web pages and provide additional information upon request. In addition, we regularly attend residents meetings to advise and update about local air quality action. The council promotes air quality action via initiatives such as Walk on Wednesdays and Play Streets for schools throughout the year. In addition, we plan local campaigns to raise awareness about local	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
	Engage with Local Business to reduce local air pollution	air quality on National action days such as Clean Air Day and Car Free Day. The main mechanism for engaging with local businesses is via uptake and implementation of workplace travel plans. We have started work to produce general guidance for local businesses to include opportunities for engaging local businesses in local air quality action. The council undertaken a trial study to explore options for retiming some HGV movements in Wembley town Centre. We were able to determine that, by undertaking deliveries outside of peak hours, we could achieve local air quality and wider environmental benefits. We intend to build on this early work and will consider trial delivery redistribution or optimisation for small businesses in other areas as the next phase of this work. We will also explore the feasibility of a scheme to consider off-peak home deliveries or using local collection as part of this work.	
	Ensure schools join the school travel planning programme	All Brent schools have travel plans and we are currently working with those with existing travel plans to achieve higher levels of compliance, attain STARS accreditation or maintain existing gold accreditation in the same scheme. In Brent 50 schools and 20 nurseries have an active travel plan promoting sustainable and safe ways of travelling. 40% of schools with existing travel plans have attained a higher level of compliance.	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
Exposure Reduction	School Audit programme	The Mayor of London launched their School Air Quality Audit Programme in January 2017. 2 Brent primary Schools, Ark Franklin Primary Academy & John Keble C of E Primary School, participated and audits were completed in December 2017. The council has provided match-funding to implement action plans devised from each bespoke audit. The council has started works to identify and prioritise schools subject to the greatest exposure to pollution based on the principles outlined in the Mayors audit programme. This will include the provision of packs to schools to conduct their own audits and the provision of additional support and guidance to devise local action plans.	
	Identify and develop Low Emission Neighbourhood~~s~~ where feasible	The council has begun work to explore options for the provision of measures which will contribute to local low emission neighbourhoods or areas. Initially will target action in four areas – Neasden Town Centre, Church End, Wembley and Tokyngton and the Kilburn Regeneration Area.	
	Reduce emissions to air from industrial installations	The council regulates some polluting processes via the Environmental Permitting Regime to ensure businesses with the greatest polluting potential comply with the law. The council ensures that local emissions from the polluting of these installations are appropriately controlled. Each is inspected in accordance with an agreed regime and the council expects to complete all by the end of the year. In addition, the council has investigated 12 complaints made in respect of emissions from	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
		industrial installations in 2017/18. No enforcement action was taken in respect of these installations.	
	Targeted upgrade of green infrastructure	The council aims to double current planting numbers and has committed to planting around 18000 street trees. We aspire to plant more where we can continually identify opportunities for the enhancement of green infrastructure at appropriate locations, especially in areas where exposure to poor air quality is high and provision of green space is low. In 2017/18, the council identified an area for enhanced provision of street trees in Neasden Town Centre. 30 trees will be planted by spring 2018. In addition, the council is committed to encouraging local residents to contribute to identification of new areas, maintenance of green space and, with this aim, endorses community-led programmes such as Adopt-a-Tree so that residents can take ownership of green spaces in their local areas.	
	Promote air pollution forecasting and route planner tools	The council is currently a member of the Airtext consortium. We continue to promote the use of the AirText messaging service via our website and community events such as air quality action days. We also continue to promote similar route planning applications such as Walkit to allow the community to make informed travel choices on high pollution days. The council ensures air quality impacts are communicated when promoting initiatives such as Walk and Stride and during public consultation of key documents such as the Cycling strategy and Long Term Transport Strategy.	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
Emissions from Developments and Buildings	Reduce construction emissions	The council reviews potential air quality impacts from all major development and, in accordance with local- and regional policy (and the GLAs Supplementary Planning Guidance) requires developers to mitigate impacts from construction dust and plant / vehicle emissions. In 2017 Construction Management Plan were reviewed and agreed for 54 development sites. Where appropriate, controls are implemented to ensure that development is air quality neutral. The council is currently a member of the London Low Emission Construction Partnership (LLECP) and has just begun work to inspect sites in the Borough to determine compliance with the Non-Road Mobile Machinery (NRMM) regulations. To date we have conducted 12 proactive inspections.	
	Limit impact of new development using planning controls	The council reviews all new planning applications for potential air quality impacts and requires all new development have no additional impact on local air pollution as a minimum requirement. The council undertakes proactive assessment of the air quality impacts of new development, reviews construction method statements, enforces planning and environmental legislation and requires all new development to be air quality neutral or better. No requests for agreements under Section 106 or via the Community Infrastructure Levy were made in 2017/18 to secure air quality improvements.	

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
	Enforce Combined Heat and Power and biomass air quality policies	The council requires all new major developments use low and ultra-low emission as standard practice, via the planning regime. The council reviews all applications to ensure that all energy generating equipment such as boilers achieve the highest emission standards.	
	Promote energy efficiency retrofitting projects in workplaces and homes	The council proactively promotes initiatives to cut energy use, signpost commercial and residential building owners to assist them to replace old boilers and encourage them to adopt other measures to get the most out of energy they use. An example of this is Brent current partnership with the Mayor of London on an innovative new scheme offering high-quality solar photovoltaic (PV) panels to help deliver the Mayor's vision of a zero-carbon city.	
	Promote and enforce Smoke Control Zones	Brent is entirely a smoke control zone and the council control the types of fuels that should be used in commercial and domestic buildings by enforcement of the Clean Air Act. The council issues guidance to assist businesses and residents to make informed choices about the least polluting fuels and equipment they can use.	
	Reduce emissions from the burning of waste and from waste facilities	The council actively discourages the domestic burning of waste and provides alternatives such as green waste collection service. Burning of waste on commercial premises and at waste facilities is prohibited. The council dealt with 412 complaints regarding	The council is currently creating a register of local plant so that we can map and monitor local increases in energy-generating plant, provide guidance regarding future installations and

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
		nuisance from the burning of waste and issued 28 abatement notices in 2017/ 18. The council received 8 complaints in relation to waste sites within the borough. The council effectively managed this via liaison with the regulatory authority, the Environment Agency, where appropriate. No formal enforcement action was required.	implement further controls where needed.
	Improve energy efficiency in council buildings	Our Civic Centre is officially recognised as the greenest public building in the UK, through its BREEAM Outstanding accreditation. The council is currently reviewing energy use in Brent-owned buildings and associated operations to determine options for reducing emissions. We are currently signposting commercial and residential building owners to initiatives such as the GLA-led RE:NEW and RE:FIT programmes and intend to include this in our guidance to schools to be issued later this year. Work is currently underway to install a Neighbourhood Heating System as part of the South Kilburn Regeneration Programme. The aim of this is to deliver on our localised sustainability strategy, to ensure that new and future developments achieve a 40% carbon reduction and potentially zero carbon in the long term. The council is currently replacing nearly 21,000 street lights across the borough with new, energy efficient LED (Light Emitting Diode) lights. The programme of works is expected to be completed by	Information about the sustainable elements of the Centre can be found in the building case study which formed part of the BREEAM assessment.

Measure	Action	Progress (-Emissions/Concentration data - Benefits - Negative impacts / Complaints)	Further information
		November 2018. A reduction in energy cost of approximately £850,000 per year as well as carbon emissions.	
	Update our procurement policies	The council's procurement policy is scheduled for review this year. Environmental performance of suppliers in all new contracts and this is a key selection criterion in our tendering process. We are also committed to reviewing existing contracts to ensure that opportunities for improvements are identified and will set out our environmental standards in our updated policies.	
	Investigate options for less polluting deliveries	In October 2017 the council completed the second phase of a project which explored the potential for reducing vehicle emissions by re-timing commercial deliveries and co-ordinating actions from a number of commercial operators, maximising potential reductions in local congestion.	

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in London Borough of Brent in 2017

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	*30*
Number of planning applications required to monitor for construction dust	12
Number of CHPs/Biomass boilers refused on air quality grounds	0
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	4
Number of developments required to install Ultra-Low NO_x boilers	20
Number of developments where an AQ Neutral building and/or transport assessments undertaken	9
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0
Number of planning applications with S106 agreements including other requirements to improve air quality	0
Number of planning applications with CIL payments that include a contribution to improve air quality	0
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	20 conditions included (significantly more considered in relation to Construction Method Statement conditions). We have yet to verify the number of developments registered and will undertake site audits to verify compliance once this has been confirmed.

3.1 New or significantly changed industrial or other sources

No new industrial or other sources have been identified in 2017

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Appendix A Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

QA/QC for Brent's automatic monitoring stations is provided by ERG King's College London. These stations are calibrated fortnightly by local site operator LSO, with audits every 6 months.
Calibrations are carried out by the Local Authority, EnviroTechnology and ERG King's College London. Audits are carried out by the National Physics Laboratory and are UKAS accredited.

A.2 Diffusion Tube Quality Assurance / Quality Control

All diffusion tubes are collected and set up by the local site operator (LSO) and analysed by Gradko International Ltd Laboratories (UKAS Accredited Methods) using the preparation method 20% Triethanolamine (TEA) in De-ionised Water absorbent. Blanks are subtracted for each exposure period prior to averaging to obtain the NO_2 annual average data. Annual averages have been bias adjusted using the bias adjustment factor for 2017 from the national database available on the LAQM website at http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html .

For the 2017 data a bias adjustment factor of 0.89 was used which is derived from 34 studies nationwide.

Short-term to Long-term Data Adjustment

A final measurement data set was produced by King's College following retrospective ratification of the measurements using procedures which exceed the requirements given by LLAQM.TG(16). During ratification, information from regular calibrations, audits and daily manual validation were used to establish an operational and calibration history of the instruments. The pollution measurements were then corrected to establish traceability to National Meteorological Standards. Details of the monitoring site and the final dataset can be found at www.londonair.org.uk.

Appendix B Full Monthly Diffusion Tube Results for 2017

Table M. NO_2 Diffusion Tube Results

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2017 % [b]	Annual Mean NO_2													
			Jan	Feb	Mar	Apr	May	Jul			Sep	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
1	82%	82%	**65.8**	**41.7**	**42.6**	**38.6**	**36.3**	35.1	33.4	35.6	-	-	**37.3**	-	40.7	36.2
2	82%	82%	**70.5**	**43.3**	**47.7**	**48.0**	**46.8**	**42.7**	**45.0**	**44.3**	-	-	**34.1**	-	46.9	41.8
4	82%	82%	**80.7**	**46.9**	**57.3**	**43.7**	**51.0**	**40.7**	40.1	**38.4**	-	-	**33.4**	-	48.0	42.7
7	100%	100%	**101.1**	**62.6**	**60.4**	**73.8**	**77.3**	**74.1**	**70.2**	**65.2**	**75.7**	**62.3**	**53.5**	-	70.6	62.8
9	82%	82%	**83.2**	**52.4**	**53.6**	**59.4**	**54.1**	**56.8**	**49.5**	**52.5**	-	-	**43.0**	-	56.0	49.9
17	91%	91%	**85.9**	**58.4**	**50.5**	**61.9**	**56.1**	**65.8**	**67.6**	**60.9**	**61.1**	**57.2**	-	-	62.5	55.7
21A	100%	100%	**87.3**	**51.2**	**48.2**	**51.9**	**49.6**	**44.4**	**46.3**	**46.3**	**54.9**	**59.9**	**39.8**	-	52.7	46.9
22	73%	73%	**95.6**	**54.9**	**63.0**	**77.2**	**62.7**	**68.6**	-	**63.8**	-	-	**36.8**	-	65.3	58.1
23	82%	82%	**141.5**	**74.8**	**76.2**	**117.4**	**100.5**	**106.5**	**98.4**	-	**117.0**	**117.2**	-	-	105.5	93.9
26	91%	91%	**105.1**	**45.5**	**60.7**	**76.0**	**69.4**	**72.6**	**68.1**	**65.6**	**70.0**	**62.8**	-	-	69.6	61.9
29	64%	64%	**116.9**	**73.5**	**41.5**	**70.1**	**54.3**	-	**36.6**	-	-	-	**44.3**	-	62.4	55.6
30	73%	73%	**82.1**		**44.8**	**64.3**	**52.8**	**54.8**	-	-	**66.3**	**62.4**	**33.6**	-	57.6	51.3
33A	73%	73%	45.5	28.7	25.4	17.9	23.1	17.5	-	20.6	-	-	21.0	-	25.0	22.2
41	82%	82%	**75.6**	**74.6**	**52.3**	**66.1**	**66.3**	**65.4**	**76.8**	-	**68.2**	**62.6**	**66.9**	-	67.5	60.0
48	82%	82%	**91.4**	**54.0**	-	**67.7**	**61.8**	-	**63.5**	**67.0**	**71.1**	**62.5**	-	-	67.4	60.0
52 A	**100%**	100%	**106.8**	80.5	85.5	93.4	102.3	98.7	**91.7**	**99.8**	**93.4**	**90.6**	**80.9**	-	93.0	82.8
52 B	**100%**	100%	**124.2**	91.5	91.9	99.3	141.0	101.8	**91.1**	**89.7**	**98.0**	**90.6**	**104.6**	-	102.2	90.9
52 C	**100%**	100%	**129.7**	82.6	81.4	103.4	107.9	108.2	**96.5**	**99.5**	**100.2**	**90.1**	**64.2**	-	96.7	86.1
53	**100%**	100%	**107.3**	**49.8**	**61.0**	**70.1**	**85.8**	**89.2**	**85.9**	**74.7**	**86.3**	**90.6**	**43.8**	-	76.8	68.3
54	**91%**	91%	**70.3**	**54.2**	**43.2**	**54.9**	**46.0**	**52.1**	-	**53.1**	**57.1**	**45.3**	**40.8**	-	51.7	46.0
BRT 42	**100%**	100%	**80.6**	**49.1**	**44.2**	**41.4**	**54.0**	**43.8**	**43.1**	**40.8**	**48.8**	**41.9**	**36.1**	-	47.6	42.4
BRT 43	**100%**	100%	**127.4**	**69.6**	**80.0**	**69.0**	**79.4**	**82.1**	**84.3**	**71.4**	**90.2**	**85.2**	**72.6**	-	82.8	73.7
BRT 53	**100%**	100%	**97.7**	**73.0**	**66.5**	**67.3**	**83.1**	**85.6**	**76.9**	**74.1**	**80.4**	**62.3**	**36.0**	-	73.0	64.9
BRT 55	100%	100%	**126.0**	**77.1**	**67.0**	**103.9**	**94.0**	**99.0**	**83.5**	**86.5**	**75.8**	**62.5**	**72.6**	-	86.2	76.7
BRT 56	**82%**	**82%**	**96.5**	**62.9**	**54.7**	**66.6**	**66.2**	**71.4**	-	-	**59.6**	**46.0**	**65.5**	-	65.5	58.3

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2017 % [b]	Annual Mean NO_2												
			Jan	Feb	Mar	Apr	May	Jul			Sep	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
BRT 57	**73%**	**73%**	**94.7**	**67.6**	**59.2**	**69.4**	**73.2**	**73.2**	**-**	**-**	**79.5**	**62.6**	**-**	**-**	**72.4**	**64.4**
BRT 58	**100%**	**100%**	**85.7**	**54.0**	**53.2**	**57.2**	**60.6**	**64.6**	**58.3**	**57.6**	**62.6**	**56.9**	**41.1**	**-**	**59.3**	**52.7**

Exceedance of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**.

[a] Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] Data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75